ANTHROPOMETRIC MEASUREMENT WORKSHOP

Sponsored by
The Massachusetts Department of Public Health
Office of Nutrition
150 Tremont Street
Boston, Massachusetts
02111

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Physical growth is one of the best indicators of the health and nutritional status of children. Body length or height and body weight are the measurements most commonly used to assess physical growth. Accuracy of these measurements and careful plotting on standard growth charts are essential for an accurate health and nutrition assessment. To assure and maintain accuracy, all staff must use standard procedures when taking measurements and equipment must be properly maintained.

The purpose of this workshop is to provide training in anthropometrics so consistent techniques will be used by all staff to assure accuracy of measurements. One staff person should be identified at each site who will be responsible for training new staff and maintaining equipment.

Goals of the Workshop:

1. To optimize and standardize length/height and weight measuring techniques.

2. To standardize equipment.

3. To assure accuracy in plotting and to maximize the use of standard growth charts in health and nutrition assessment.

Training Objectives:

Upon completion of this training, the learner will be able to:

1. Properly calibrate and maintain measuring equipment.

2. Accurately measure the length/height of infants and children according to standard procedures.

3. Accurately weigh infants and children according to standard procedures.

4. Correctly plot and interpret growth measurements using a growth chart appropriate for the child's age and sex.

Learning Methods:

1. Discussion/Lecture: Length, Height and Weight in Health Assessment.

2. Slide Presentation/Discussion: "Assessment of Children: A Guide to Weighing and Measuring".

3. Practice Session: Weighing and measuring infants and children.

4. Discussion/Lecture" Plotting and interpreting growth charts.

5. Practice Session: Plotting and interpreting growth charts.

EQUIPMENT STANDARDS

Infant's Weight	-	Balance beam pediatric scale with tray. Measurable in increments of 10 grams or 1/2 ounce. Capacity 30 pounds or greater.
Infant's Length	-	Infant measuring board with fixed headboard and sliding footboard. Board should measure to a minimum of 39 inches, in increments of 1/8 inch.
Child's Weight	-	Balance beam scale measurable in increments of 100 grams or 1/4 pound.
Child's Height	-	Wall-mounted or portable stadiometer in increments of 1/8 inch OR a flat, metal measuring tape mounted on wall (zero mark to the floor) with a wooden, right-angle head piece.

(See Appendix A for recommended equipment list and manufacturers).

COMMON ERRORS OF MEASUREMENT

A. Equipment-Related

1. Use of inadequate instruments, such as bathroom scales, yardsticks and stretchable tapes which are not properly attached to a table or wall.

2. Scale not calibrated to zero.

3. Poor maintenance of equipment resulting in inaccuracy. For example, worn, loose or broken sliding headboards and footboards on infant measuring boards.

B. Technique-Related

1. Using incorrect instrument for age of child. For example, using an infant measuring board (recumbent length) to measure a child two years or older who is able to stand.

2. Measuring the length or height of a child when he/she is not properly positioned. For example, knees bent, body arched, head not in correct plane or headboard not firmly against crown of head.

3. Child wearing unreasonable amount of clothing. For example, shoes, headwear, heavy sweaters, wet diapers.

4. Measuring infants unassisted or trying to measure children who are unmanagable.

5. Failure to obtain a second confirming measure.

6. Failure to record measurements immediately and accurately.

MEASURING AN INFANT'S WEIGHT

- An infant beam balance scale with a tray and non-detachable free-sliding weights is used. The scale is marked in increments of 1/2 ounce or 10 grams.
- Infants and children who weigh more than 30 pounds are weighed on an adult scale.
- With nothing on the scale, zero the equipment by sliding the weights on the horizontal beam to the zero position. Check that the scale is in balance. Scale indicator should be pointed at zero with nothing on the scale. If not, use the adjustment screws to move the adjustable zeroing weight until the beam is in zero balance.
- If the infant is to be weighed on a pad, zero the equipment with the pad on the scale.
- Have a parent or assistant available when weighing an infant.
- Remove the infant's clothes. Infants may wear a dry diaper.
- Place infant on the scale.
- Move the weights to the right until they balance the weight of the infant. Read to the nearest 1/2 ounce or nearest 10 grams.
- Repeat procedure until you get two readings that agree within 1/2 ounce or 10 grams. Record measurement immediately.

MEASURING A CHILD'S WEIGHT

- A beam balance scale with non-detachable free-sliding weights is used. The scale is marked in increments of 1/4 pound or 100 grams.
- With nothing on the scale, zero the equipment by sliding the weights on the horizontal beam to the zero position. Check that the scale is in balance. If not, use the adjustment screws to move the adjustable zeroing weight until the beam is in zero balance.
- Child should be wearing minimal indoor clothing. Remove shoes, hats, heavy clothing, belts and heavy jewelry. Be sure pockets are empty.
- Ask child to stand in the center of platform. If necessary, have a parent or assistant help in positioning the child.
- Move the weights to the right until they balance the weight of the child. Read to the nearest 1/4 pound or 100 grams.
- Repeat procedure until you get two readings that agree within 1/4 pound or 100 grams. Record measurement immediately.

MEASURING AN INFANT'S LENGTH

- Infants and children under age 2 are measured lying down (recumbent length).
- Before you start, check that the measuring board is working correctly and that the "0" mark on the tape or yardstick is at the fixed headboard.
- Remove infant's shoes, any head wear and other clothing that will interfere with measurement.
- Have a parent or assistant help in positioning child.
- Place the infant lying face up so that the body is in line with the tape or yardstick.
- Have the assistant hold the infant's head firmly against the fixed headboard. Infant's eyes are looking up.
- Straighten the infant's knees and make sure body is fully extended.
- With the other hand, move the footboard until it is resting firmly against the infant's heels. Toes should be pointing directly up.
- Read the measurement to the nearest 1/8 inch or 0.5 cm.
- Repeat this procedure until you get two readings that agree within 1/8 inch. Record measurement immediately.

MEASURING A CHILD'S HEIGHT

- Children two years or older who are able to stand well are measured standing.
- Before beginning, verify that the "0" mark on the tape or yardstick is at floor level.
- Have a parent or assistant help in positioning child.
- Remove the child's shoes, heavy socks and head wear.
- Stand the child with back against the measuring surface.
- Ask the child to stand straight and tall with eyes straight ahead and heels slightly apart. Heels, buttocks, and shoulder blades touch the wall or measuring surface. Be sure child's feet are flat on the floor.
- Position head block firmly against crown of head.
- Check child's position. Without removing head block, ask the child to step away from measuring surface and read measurement to the nearest 1/8 inch or 0/5 cm.
- Repeat procedure until you get two readings that agree within 1/8 inch. Record measurement immediately.

GROWTH CHARTS

Height and weight are the two most important measurements taken in nutrition screening of children. However, measurements are only as useful as they are accurate. Reliability of anthropometric data can be affected not only be equipment and technique, but also by the accuracy of plotting these data on growth charts and interpreting the results.

We recommend you use National Center for Health Statistics (NCHS) growth charts (Appendix). These growth charts were developed in collaboration with the Centers for Disease Control and were based on measurements of a representative sample of U.S. children. Clinical use of growth charts can show how the growth of any child ranks in comparison with the rest of the U.S. child population of like age and sex. The following are other important uses of growth charts:

1. Assessing the nutrition and health status of children and tracking growth patterns.

2. Monitoring trends in growth and nutritional status in population studies.

3. Evaluating the impact of nutritional interventions.

4. Describing nutritional outcomes in epidemiologic studies.

Choosing the Correct Growth Chart

Check that you are using the appropriate chart for sex and age of the child or infant. Chronological age is the most influential variable in rapidly growing children, so it is essential to know the exact age of the child on the date of measurement and to choose the correct chart for accurate plotting:

Determining age:

Infants: round an infant's age to the nearest 1/2 month. To round, follow these basic rules:

0-7 days - round down to the whole month.
8-14 days - round up to the 1/2 month.
15-21 days - round down to the 1/2 month.
22-31 days - round up to the whole month.

For example, if an infant is 6 months 1 week (or 7 days), round down to 6 months. If an infant is 6 months 17 days, round down to 6 1/2 months.

Children: round a child's age to the nearest month:

0-15 days - round down to the previous month.
16-31 days - round up to the next month.

For example, if a child is 3 years 4 months 1 week, round to 3 years 4 months.

Choosing the correct growth chart:

- Birth - 36 month: this chart represents recumbent measurements (lying down), not standing measurements. Stature is not plotted on this chart. Use the 2-18 years chart instead to plot standing height; children under age 2 should always be measured lying down and plotted on the birth-36 month growth chart.

- 2- 18 year: this chart represents standing measurements. Children 2 to 3 years old who are measured standing are plotted on this chart. All children over age 3 should be measured standing and plotted on this chart. Recumbent length should not be plotted on these charts. (Use the birth-36 months chart for recumbent length only).

- 2 - 5 year: this chart has been developed for easier and more accurate plotting of preschoolers. It should only be used for children who are measured standing. Children ages 2 to 3 measured lying down should be plotted on the birth - 36 month growth chart.

Correcting Age for Prematurity

Age adjustments are based on 40 weeks gestational age. The weight and length for an infant born prematurely should be plotted at the age obtained by subtracting the number of weeks or months premature from the age at the time of measurement.

Example: Baby girl born on 1/15/88.
Expected date of delivery was 4/15/88.
Her weight and length were taken on 5/15/88.

Chronological age on 5/15/88	4 months
Number of months premature	3 months
Corrected age	1 month

- The height and weight can now be plotted on a standard NCHS growth chart (birth - 36 months) for girls at the corrected age.

- Age should be corrected for prematurity up to 2 years for weight and 3.5 years for height.

- Corrected age can also be plotted using a premature growth chart, designed specifically for premature infants. It can be used for both sexes and includes percentiles for 26 weeks gestation to 12 months of age. In some cases this may be the required procedure. See example below.

Example: Baby boy born on 2/14/88.
Expected date of delivery was 4/28/88.
His weight and length were taken on 3/28/88.

Chronological age on 3/28/88	6 weeks
Number of weeks premature	10 weeks
Corrected age	-4 weeks or
	36 weeks gestation
	(40 weeks - 4 weeks =
	36 weeks gestation)

- Since the corrected age is less than one day, the growth data cannot be plotted on a standard NCHS growth chart. Data must be plotted on a premature growth chart.

- Premature growth charts are used until approximately 3 months corrected age, at which point a standard NCHS growth chart can be used. (However, continue to use corrected age until 2 years for weight and 3.5 years for height).

Plotting on the Growth Chart

The NCHS Growth Charts include three types of graphs which allow you to plot Weight for Age, Height or Length for Age and Weight for Height:

I. Weight for Age: a measure that compares a child's weight at a particular age with children of the same sex and age.

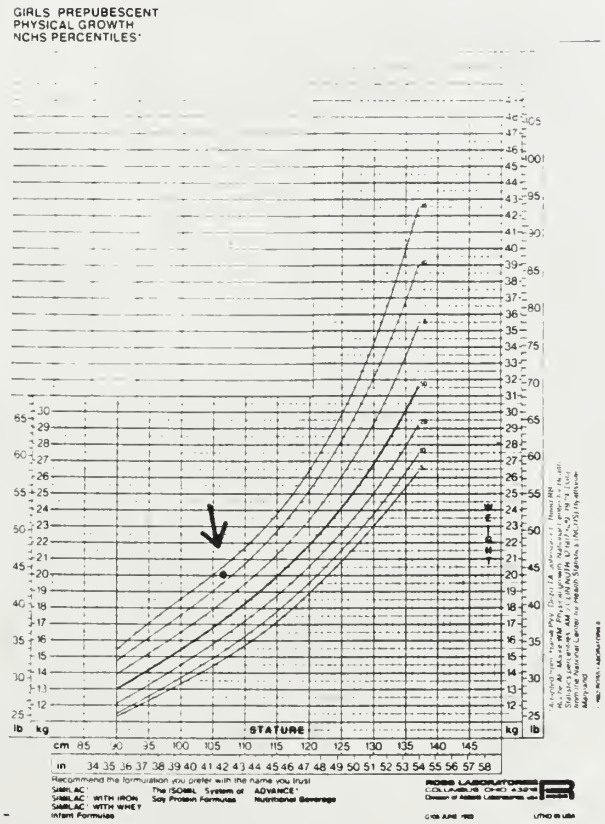
- Find the child's/infant's age on the horizontal scale.
- Find the child's/infant's weight on the vertical scale.
- Using an accuplot or clear plastic triangle, draw a dot or a small X where the two lines intersect.

II. Height/Length for Age: a measure that compares a child's height or length at a particular age with children of the same sex and age.

- Find the child's/infant's age on the horizontal scale.
- Find the child's/infant's height/length on the vertical scale.
- Using an accuplot or clear plastic triangle, draw a dot or a small X where the two lines intersect.

III. Weight for Height: a measure that compares a child's weight for height with children of the same sex.

- Find the child's/infant's height or length on the horizontal scale.
- Find the child's/infant's weight on the vertical scale.
- Using an accuplot or clear plastic triangle, draw a dot or a small X where the two lines intersect.



Example:

A 4-year old girl measures 42" in a standing position. Her weight is 44 pounds. Find her stature on the horizontal scale and her weight on the vertical scale. Using an accuplot or clear plastic triangle, make a dot or small X where the two lines intersect. This child falls between the 90th and 95th percentile for weight for height. Referral for further evaluation may be indicated. See page 12 - Growth Chart Interpretation.

Growth Chart Interpretation

Of the three commonly used relationships expressing height or weight, two are considered most sensitive: height or length for age (a measure of tallness or shortness) and weight for height or length (a measure for overweight or thinness). A third measure, weight for age, can also provide information on overweight or thinness. However, the measure is less sensitive and should be followed up with a height/age and weight/height measurement.

Basic Growth Chart Guidelines

WEIGHT FOR HEIGHT/LENGTH:

- 10th to 90th percentiles -- Likely to represent normal growth.
- 5th to 10th and 90th to 95th percentiles -- Moderate risk; referral for further evaluation may be indicated.
- Above the 95th percentile -- Overweight. Carefully check for measurement and plotting accuracy. Give priority for referral and follow-up.
- Below the 5th percentile -- Underweight. Carefully check for measurement and plotting accuracy. Give priority for referral and follow-up.

HEIGHT/LENGTH FOR AGE:

- 5th to 95th percentiles -- Likely to represent normal growth.
- 95th percentile and above -- Likely to represent normal growth; however, excessive growth may indicate hormone imbalance.
- Below the 5th percentile -- Short stature. May indicate delayed growth. Give priority for referral and follow-up.

WEIGHT FOR AGE:

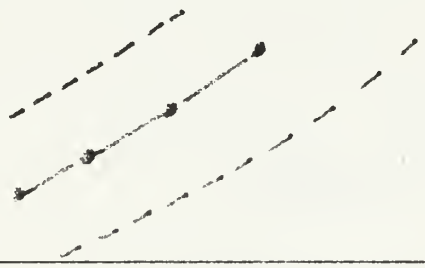
- 10th to 90th percentiles -- Likely to represent normal growth.
- 5th to 10th and 90th to 95th percentiles -- Moderate risk; referral for further evaluation may be indicated.
- Above the 95th percentile -- May indicate overweight. Verify with weight for height measurement. Give priority for referral and follow-up.
- Below the 5th percentile -- May indicate underweight. Verify with weight for height measurement. Give priority for referral and follow-up.

(Adapted from Growth Chart Guidelines, Tennessee Department of Public Health, Division of Nutrition and WIC Services).

Direction of the Growth Curve

The growth chart allows you to compare a child's growth with that of a reference population, but it also provides a visual representation of a child's growth over time. The direction of a child's growth curve is of prime importance. It can take four directions, as follows:

Upwards Curve:



A child's growth curve that is climbing upwards in the same direction as the reference curve means the child is growing adequately.

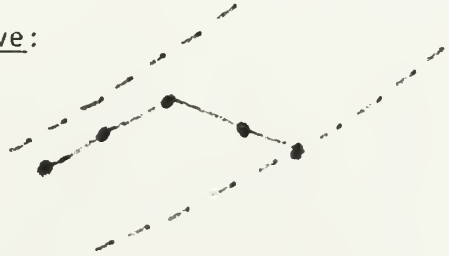
Upwards Curve Across Percentiles:

A curve climbing upwards crossing percentiles may indicate an abnormal growth pattern. A change of more than 25 percentiles in a one month period for infants (birth - 12 months) or a 6-month period for children ages 1-3 may require follow-up.

Horizontal Curve:

If a child's curve is horizontal or flattening out, it means the child is not growing. Since all healthy children grow, this is a warning sign. Follow-up may be required.

Downwards curve:



When plotted on a weight/height or length or weight/age chart, a downwards curve indicates a child is losing weight. Immediate action should be taken.

These examples show the advantage of monitoring the growth of a child over time, as compared with any single measurement at a particular time.

Appendix A

Equipment Standards

Product: Infant Length Measuring Boards

Company: Ray Allen
3738 West Locust Avenue
Fresno, CA 93711
(209) 431-4038
(8/88)

Model 1: 15 inch width
Price: $102.50 plus shipping (8/88)

Model 2: 12 inch width
Price: $ 86.00 plus shipping (8/88)

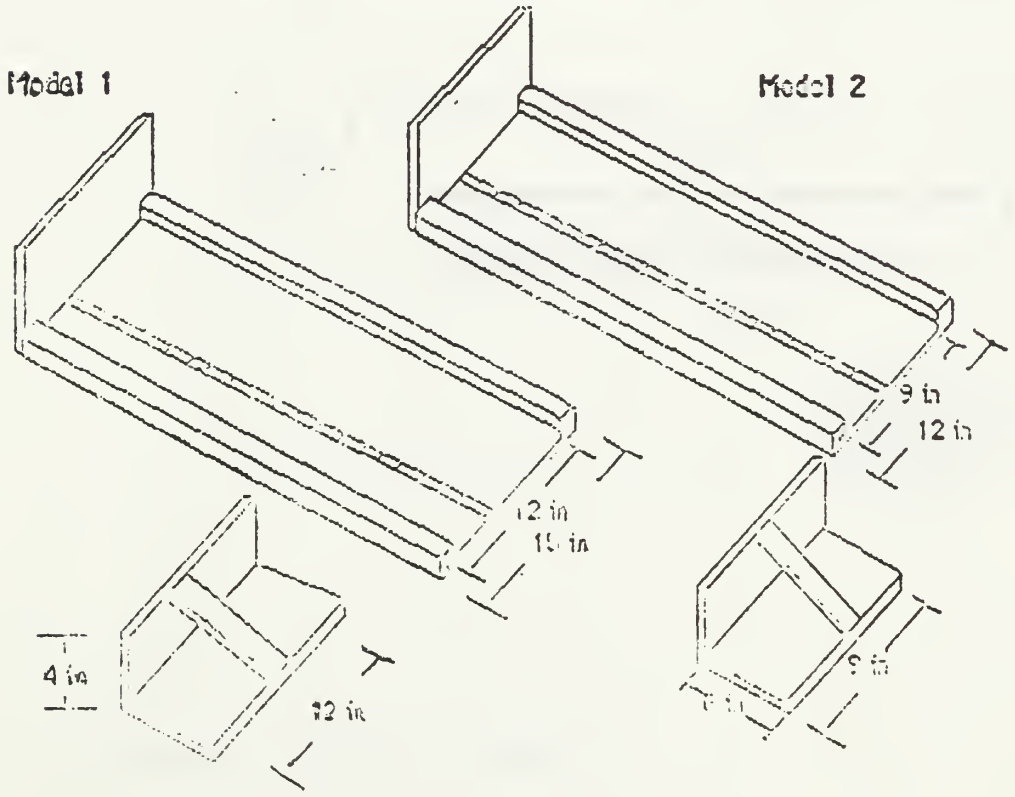
Description: Constructed of plywood and pine wood. Measurements are calibrated in inches and centimeters by a metal tape attached along one side of the board. Footboard constructed of plexiglass.

Calibration: Inches and centimeters

Dimensions: Model 1: 39 inches long X 15 inches wide X 6 in headboard and 4 inch moveable footboard (inside dimensions 39" x 12")

Model 2: 39 inches long X 12 inches wide X 6 in headboard and 4 inch moveable footboard (inside dimensions 39" x 9")

Comments: Note the width dimensions are the outside measurements of this board. For clinics measuring "chunky" 18 - 24 month old children, Model 2 with the 9 inch width may be too narrow for many children.



Product: Pediatric Lengthboard
Known as O'Leary Lengthboards

Company: Ellard Instrumentation, Ltd.
3257 17th Avenue, West
Seattle, WA 98119
(206) 285-8271

Model: Pediatric - clear acrylic
Cost: $169.00* includes shipping cost (3/88)

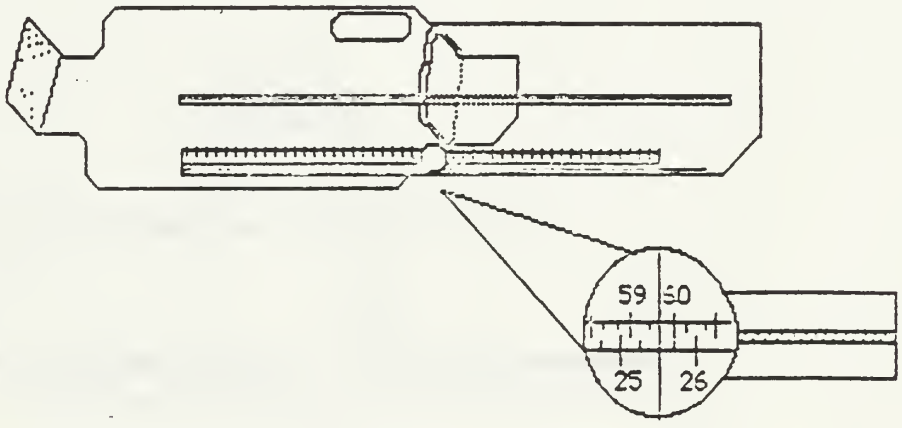
Model: Pediatric - colored acrylic alloy
Cost: $189.00* includes shipping cost (3/88)
Lengthboard base in a choice of red, white, blue
Footpiece in a choice of red, white, blue

Calibration: Inches and cm

Description: Magnified ruler in units from 35 - 110 cm and 14-43 inches
Made of sturdy, light-weight clear acrylic or colored acrylic alloy.
Weight is less than 5 1/2 pounds with a built-in handle for easy transport.

Comments: Design meets international standard for anthropometric equipment. Validity of each lengthboard carefully tested by manufacturer. Quality and durability guaranteed. Easily cleaned. Complete instruction accompany each lengthboard.

Allow 2-4 weeks for delivery via U.P.S.



* Washington state residents add 7.9% sales tax.

Product: Infantometer

Company: Seritex, Inc.
(formerly) PFister Import-Export, Inc.
450 Barell Avenue
Carlstadt, NJ 07072
(201) 939-4604

Model: 702

Price: $810.00 plus shipping (8/88)

Description: This Infantometer is a high accuracy counter recording instrument specifically designed for post-neonate growth studies. It may be used in conjunction with, and as a follow-up instruments to, the Harpenden Neonameter.

Its freely moving, ball-bearing mounted carriage is operated via a constant pressure lever, which automatically locks the carriage at the correct measuring point. This device ensures reproducibility of measurement and effectively eliminated variation due to differing operator techniques.

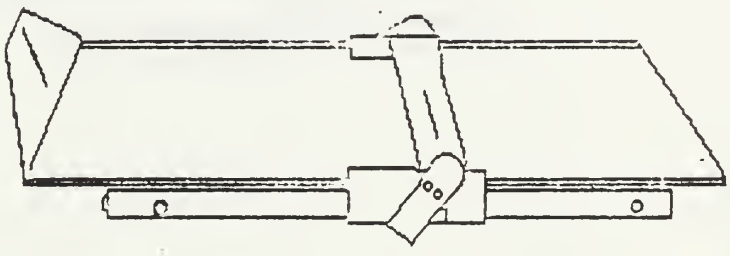
This device has a measuring range of 300 mm to 940 mm via a direct reading counter

Calibration: millimeters

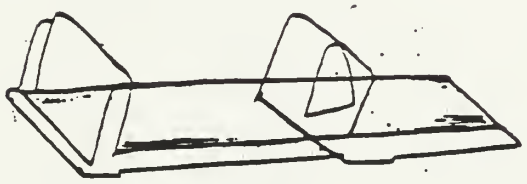
Comments: Weight 6 3/4 kg

Model 702

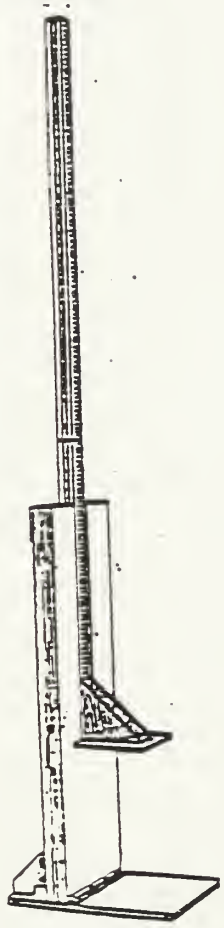
Infantometer



Product:	**Recumbent Infant Length Board**
Model:	PE - RILB-122 (12 inches wide)
Company:	Perspective Enterprises 7829 Sprinkle Road Kalamazoo, Michigan 49001 Phone: (616) 327-0869
Price:	$124.50 plus shipping (3/88)
Description:	This length board is constructed of 3/4 inch mahogany-core, oak-laminated plywood to prevent warping and aid cleaning. Has a clear plexi-glass footboard to make baby measurement easier. Measurements are read at the back end of the sliding footboard making removal of infant prior to reading unnecessary.
Calibration:	1/16th inches and 0.2 centimeters up to 39 inches and 100 centimeters
Dimensions:	43 1/2 inches long by 12 inches wide by 8 inches high
Weight:	12 pounds
Comments:	N/A



Product:	Portable Length/Stature Measuring Board
Model:	PE-A-1-M-101
Company:	Perspective Enterprises, Inc. 7929 Sprinkle Road Kalamazoo, Michigan 49001 Phone: (616) 327-0869
Price:	$286.00 plus shipping. (8/88)
Description:	Portable board, designed primarily for use in international surveys. Constructed of plywood and hardwood. Base is hinged and the head piece removable to permit carrying from one clinic to another. Measurements are made by reading a tape at the upper end of the sliding head piece. There is an extension to measure subjects up to 190 centimeters in height. Can be used in measuring both infants and adults.
Calibration:	Test conducted by Centers for Disease Control measurers found it to be accurate to within 0.2 centimeters of the group mean.
Dimensions:	N/A
Weight:	Approximately 20 pounds
Comments:	N/A



Product:	Wall Mounted Measuring Board (Height)
Model:	PE - WM-103
Company:	Perspective Enterprises 7829 Sprinkle Road Kalamazoo, Michigan 49001 Phone: (616) 327-0869
Price:	$119.25 plus shipping (8/82)
Description:	This measuring device permanently attaches to wall (mounting hardware and instructions included) and constructed of 3/4 inch laminated wood to prevent warping. Its clear plexi-glass sliding head piece is spring loaded to remain in place. Measurements of subjects up to 75 inches (190.5 cm) can be taken. Optional model for measurements to 84 inches is available on special request. Measuring tape graduated in inches and centimeters.
Calibration:	Accurate to within 1/16 inch (.2 centimeters).
Dimensions:	48 inches by 10 inches wide by 3/4 inches thick (excluding 8 inches by 8 inches by 10 inches sliding headboard piece).
Weight:	8 pounds
Comments:	N/A

SHORR PRODUCTIONS
Irwin J. Shorr
467 Prospect Street
Woonsocket, Rhode Island 02895 USA
Telephone: (401) 769-5823

Infant/Child Height Measuring Board

Specifications

Material: Wood (maple, Baltic Birch), bolt, screws, with adjustable shoulder strap, draw catch, screw eyes, measuring tape, graduated in metric units, in centimetres (in ten millimetre divisions) with a number every centimetre (1-130; English units available). All parts are glued and screwed.

Weight: 6 kg. (13 lbs. 2 oz.)

Dimensions: Height: 130 cm., collapses to 75 cm.
Base of board: 30 × 37.5 cm.
Width of back of board: 30 cm.
Thickness of back of board: 3.5 cm. when assembled
7.0 cm. when collapsed

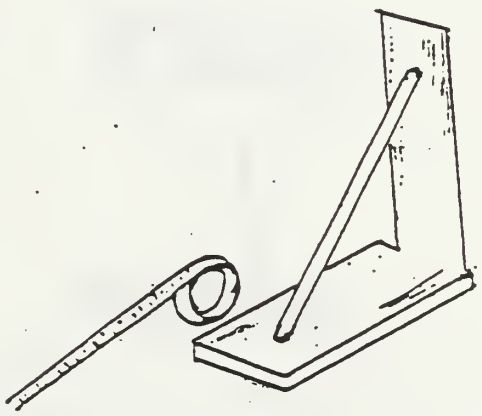
Packing and Shipping: FOB, in boxes:
84 × 39 × 33 cm. (33 × 15 × 13.5 in.)
Can be shipped via UPS:
length and girth = 91 in.

Cost: $225.

Current address (branch office) and phone number--direct contact:

Irwin J. Shorr
14119 Weeping Willow Drive #12
Silver Spring, Maryland 20906
301-460-4371

Product:	"Handi-Stat" Measuring Device Kit
Model:	PE-RA-108
Company:	Perspective Enterprises, Inc. 7829 Sprinkle Road Kalamazoo, Michigan 49001 Phone: (616) 327-0869
Price:	Right Angle Piece with Tape (set) (for Stature Measurement) $24.20 per set (3/88) Measuring Tape, Flat, Metal, English/Metric $5.00 ea. (8/83)
Description:	Easy to install, easy to read, requires little mounting space, easy on the budget hand held measurement device with flat metal tape. Tape graduated in both English and Metric units or metric units only. Flat metal tape available separately. Make sure that the tape is mounted right angle to the floor. Suggest you order either English or Metric only.
Calibration:	1/16th inches and millimeters
Dimensions:	N/A
Weight:	10-12 oz.
Comments:	Recommended for those wanting to manufacture their own measuring equipment.



Product: Health-O-Meter, Pediatric Scale

Model; Two models available
322 (pound and ounces)
322 KG (Metric) - 16 kg x 10 grams

Company: Perspective Enterprises, Inc.
7829 Sprinkle Road
Kalamazoo, Michigan 49001
Phone: (616) 327-0869
Check with your local distributor or medical supply company.

Price: 322 -$200.00plus shipping (8/88)
322KG -$202.00 plus shipping (8/88)

Description: Is equipped with an enameled steel tray with smooth plastic protective ends, is easily cleaned, and has graduations up to 35 lbs.

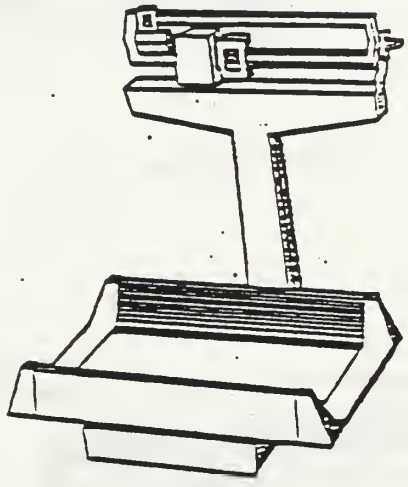
Calibration: 1/8 oz. (metric)

Dimensions: Tray: 20 in. long by 13 1/2 in. wide by 3 1/4 in. high

Base: 10 in. wide by 13 in. long

Weight: 25 lbs. (shipping weight)

Comments: Found acceptable by Centers for Disease Control.



Product: 725000 Clinical Baby Scale for Pediatric Use

Model: 725000
424000 (optional carry case model)

Company: Seca Corporation Weighing and Measuring System
8920 B Route 108, Oakland-Center
Columbia, Maryland 21045
Phone: (301) 964-3858

Distributed by: Perspective Enterprises, Inc.
7829 Sprinkle Road
Kalamazoo, Michigan 49001
Phone: (616) 327-0869
Check with your local distributor or medical supply company.

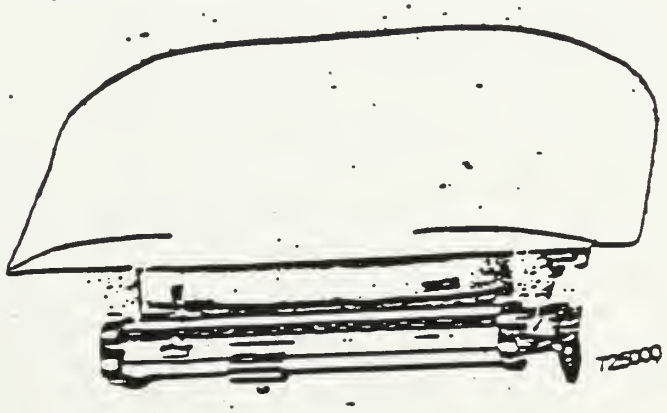
Price: $ 183.00 plus shipping (8/88)
$ 30.00 for carry ease

Description: A compact, durable and accurate baby scale with easy moving balance weights. Equipped with fitted locking device and tare adjustment to allow for the weight of disposable padding used on the tray. The baby tray is removable for easy washing and disinfecting. It has stable steel base but light weight (14 1/2 lbs.) design for portability. Permits weighing capacity up to 32 lbs. x 1/4 oz. and sensitivity 5 g. Also available in metric 16 kg. x 10 g.

Dimensions: N/A

Weight: N/A

Comments: It has not been tested by Centers for Disease Control. However, found acceptable by staff at the Michigan Department of Health.



Product: Physician's Office Scale

Model:
400 - Without measuring rod.
400 KL - Combination kilo/pound beam.
400 KG - Graduated in Metric - 160 kg x 100 grams. Without measuring rod.

Company:
Healthometer
Continental Scale Corporation (Manufacturer)
7400 West 100th Plance
Bridgeview, Illinois 60455
Phone: (312) 598-9100
Check with your local medical supplier.

Distributed by:
Perspective Enterprises
7829 Sprinkle Road
Kalamazoo, Michigan 49001
Phone: (616) 327-0869

Price:
400 - $264.00 (8/88)
400KL - $272.00 KG - $266.00

Description:
Easy-read scale. Accurate in 1/4 lb. units to 350 lbs. Functional design can be tucked in a corner and easily moved (on optional casters). Hardened pivots and bearings will give many years of accurate service. Non-slip vinyl covered platform. Three optional features - telescopic measuring road, support pillar and casters.

Calibration:
N/A

Dimensions:
Capacity - 350 lbs. x 1/4 lb.
Measuring rod - 30 to 78 in. x 1/4 in.
Platform - 10-1/2 x 14 in.

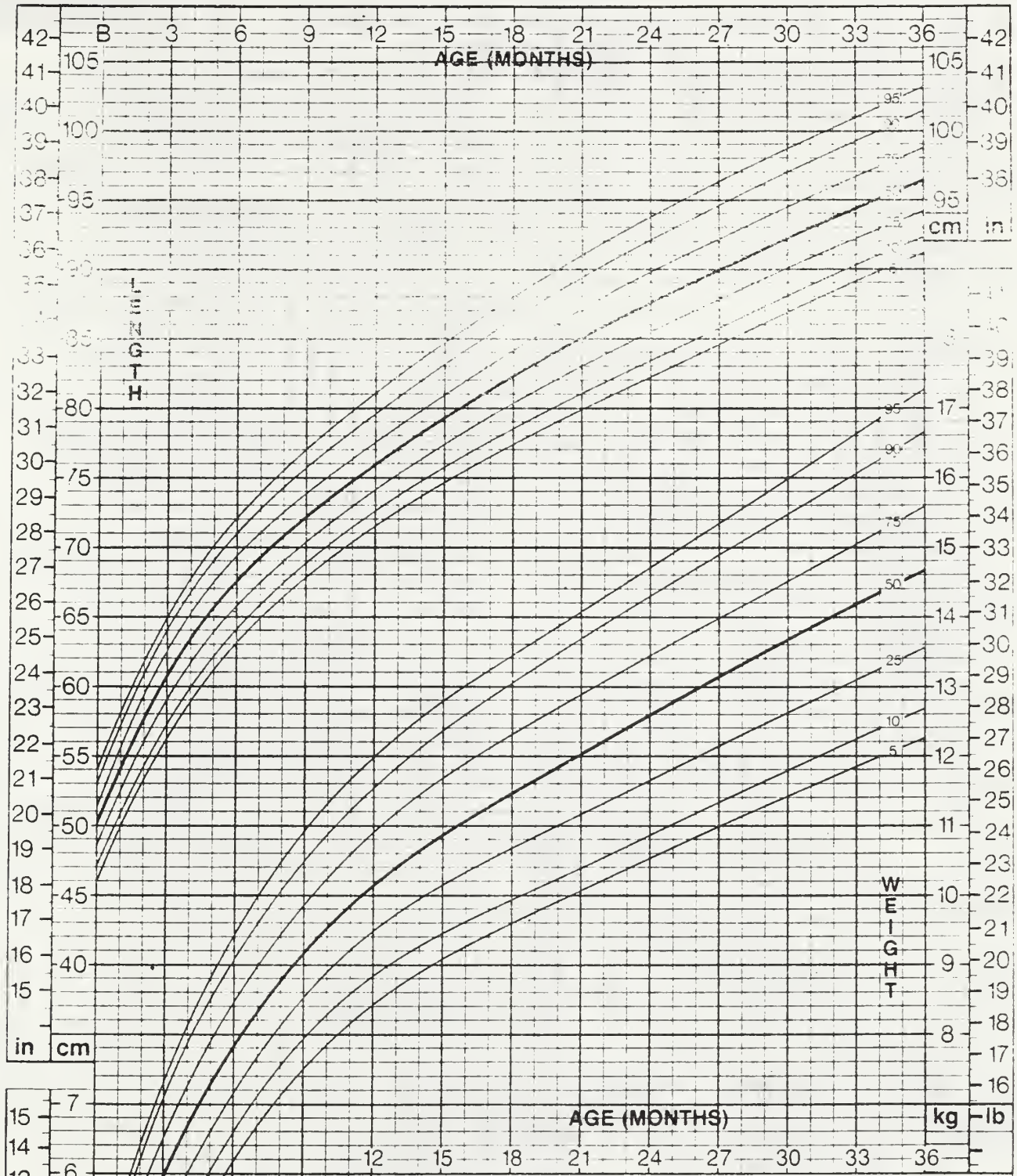
Weight:
38 lbs. (shipping weight)

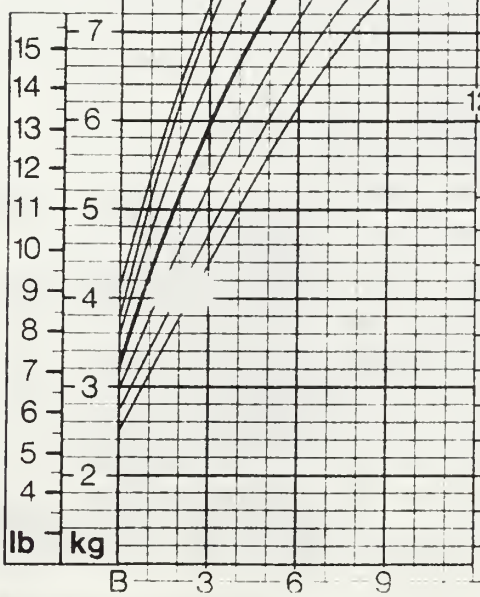
Comments:
Found acceptable by Centers for Disease Control.

BOYS: BIRTH TO 36 MONTHS
PHYSICAL GROWTH
NCHS PERCENTILES*

NAME _____ RECORD = _____

Ross Growth & Development Program





AGE (MONTHS)
12 15 18 21 24 27 30 33 36

MOTHER'S STATURE _____ GESTATIONAL AGE _____ WEEKS

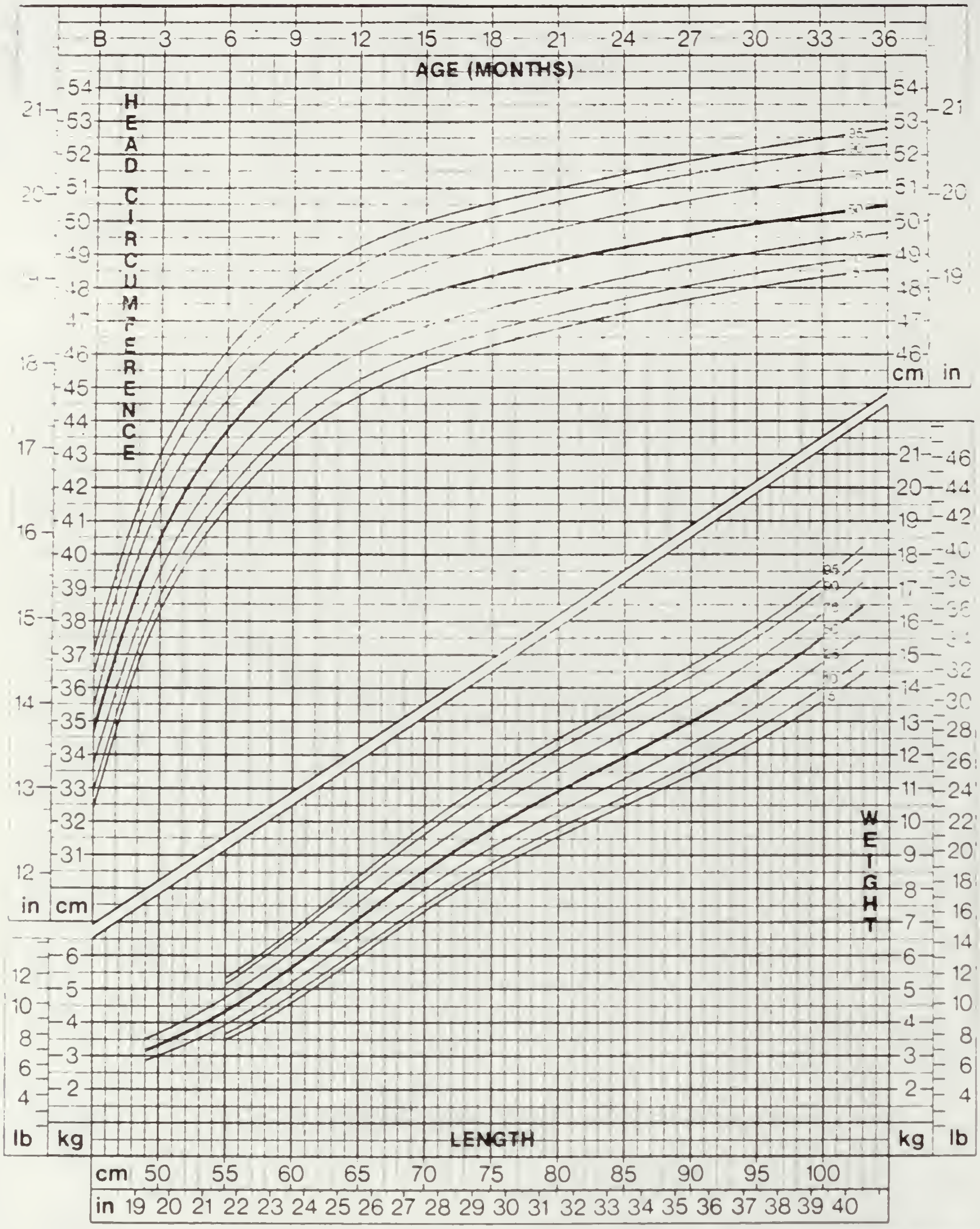
FATHER'S STATURE _____

DATE	AGE	LENGTH	WEIGHT	HEAD CIRC	COMMENT
	BIRTH				

*Adapted from: Hamill PVV, Drizd TA, Johnson CL, Reed RB, Roche AF, Moore WM. Physical growth: National Center for Health Statistics percentiles. AM J CLIN NUTR 32:607-629, 1979. Data from the Fels Research Institute, Wright State University School of Medicine, Yellow Springs, Ohio

BOYS: BIRTH TO 36 MONTHS PHYSICAL GROWTH NCHS PERCENTILES*

NAME ____________________ RECORD # ____________

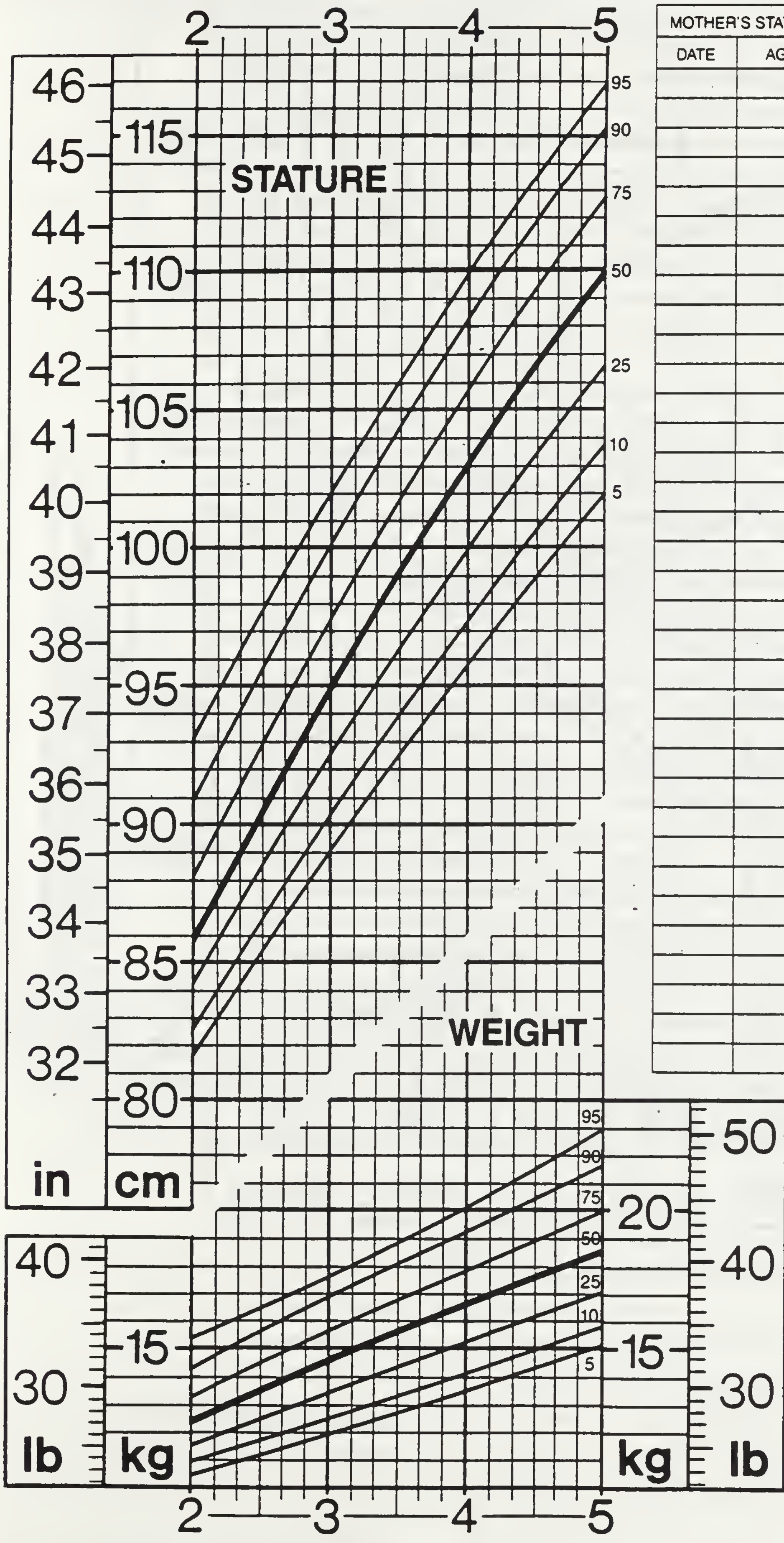


DATE	AGE	LENGTH	WEIGHT	HEAD CIRC	COMMENT

*Adapted from ...

BOYS: 2 TO 5 YEARS
PHYSICAL GROWTH
NCHS PERCENTILES*

NAME ____________________ RECORD # ____________



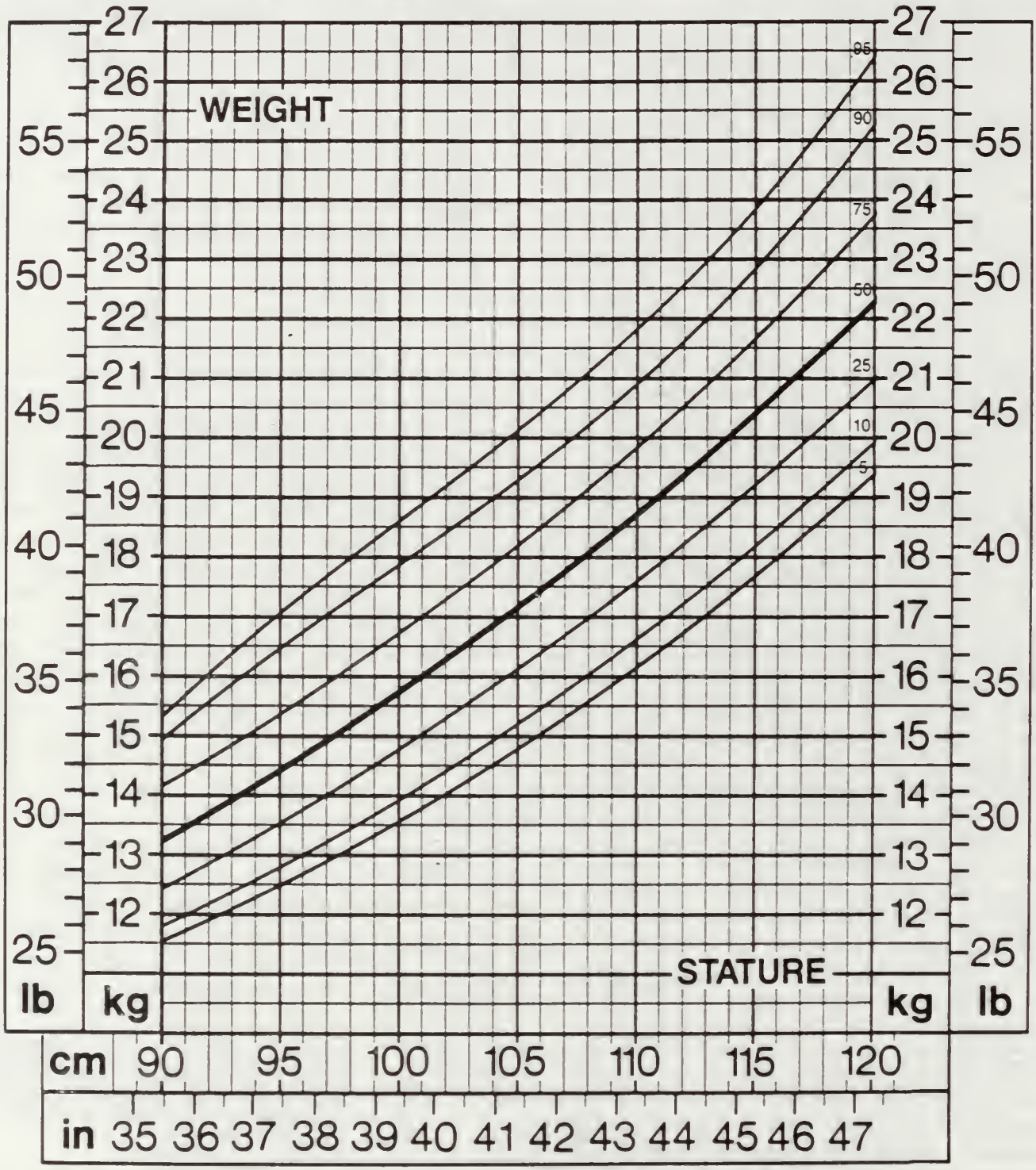
MOTHER'S STATURE ____________ FATHER'S STATURE ____________

DATE	AGE	STATURE	WEIGHT	COMMENT

*Adapted from: Hamill PVV, Drizd TA, Johnson CL, Reed RB, Roche AF, Moore WM: Physical growth: National Center for Health Statistics percentiles. AM J CLIN NUTR 32:607-629, 1979. Data from the National Center for Health Statistics (NCHS), Hyattsville, Maryland.

BOYS: PREPUBESCENT
PHYSICAL GROWTH
NCHS PERCENTILES*

NAME _____ RECORD # _____



DATE	AGE	STATURE	WEIGHT	COMMENT

*Adapted from Hamill PVV, Drizd TA, Johnson CL, Reed RB, Roche AF, Moore WM. Physical growth: National Center for Health Statistics percentiles. AM J CLIN NUTR 32:607-629, 1979 Data from the National Center for Health Statistics (NCHS), Hyattsville, Maryland

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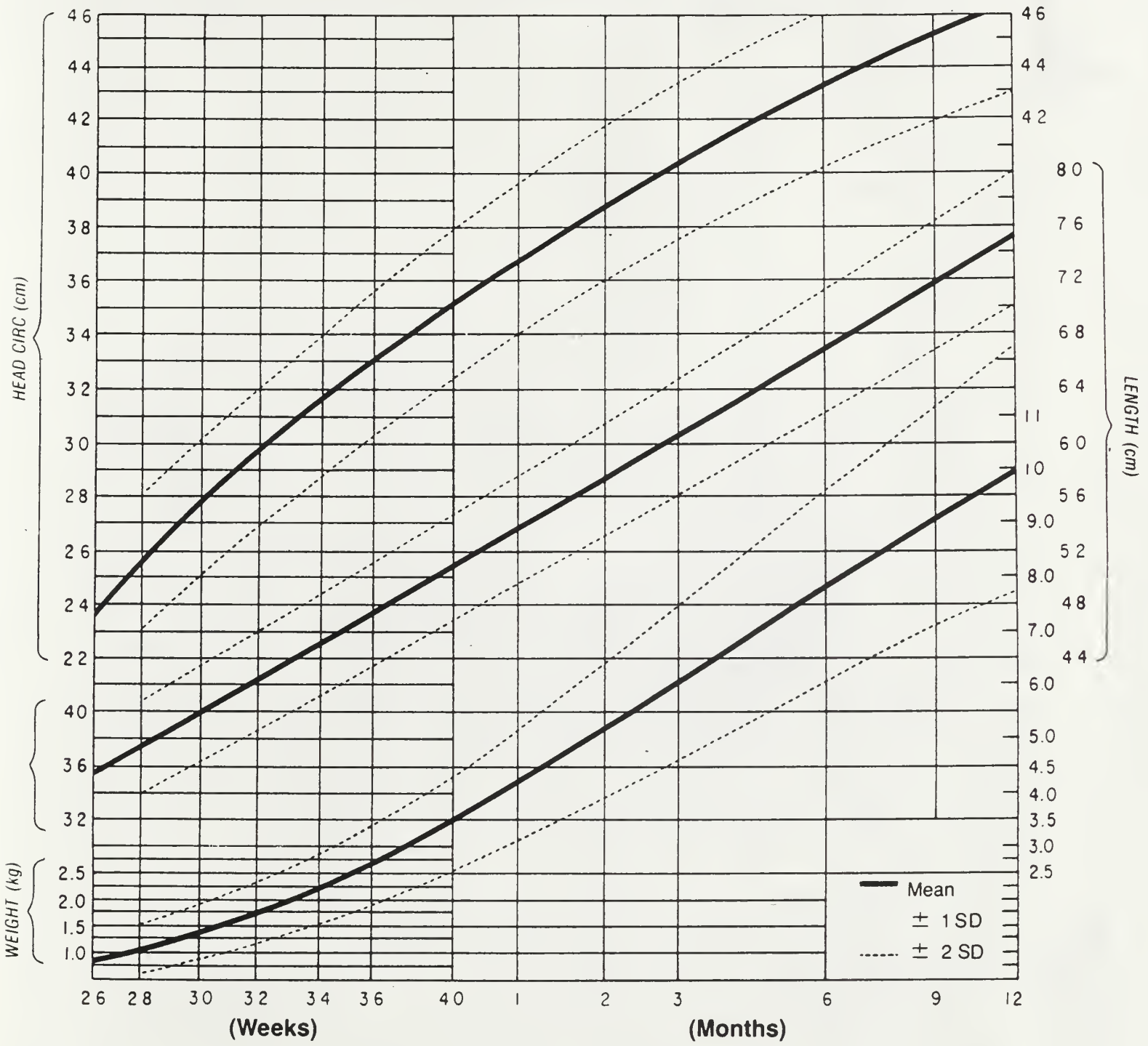
GROWTH RECORD FOR INFANTS*
BIRTH TO 1 YEAR, SEXES COMBINED

(Premature Growth Chart)

NAME _____

DATE OF BIRTH _____

I.D. NO _____



DATE	AGE	LENGTH	WEIGHT	HEAD CIRC

DATE	AGE	LENGTH	WEIGHT	HEAD CIRC

*Adapted with permission: Babson SG, Benda GI. Growth graphs for the clinical assessment of infants of varying gestational age. *J Pediatr* 89:814-820, 1976.

Provided as a service of The Ross Hospital Formula System

ROSS LABORATORIES
COLUMBUS, OHIO 43216
Division of Abbott Laboratories, USA

G413(0.05) SEPTEMBER 1986 LITHO IN USA

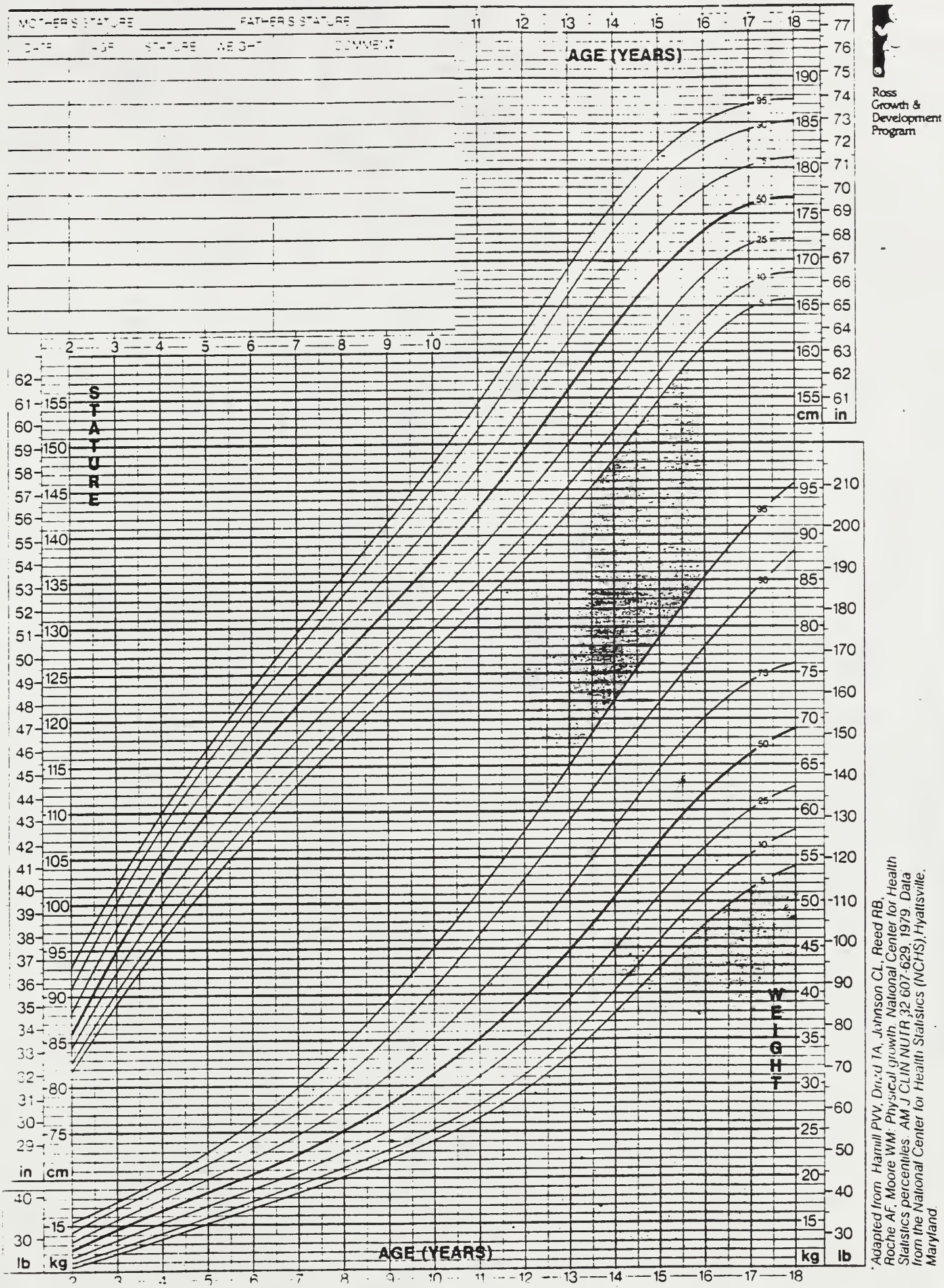
Appendix C

BOYS: 2 TO 18 YEARS
PHYSICAL GROWTH
NCHS PERCENTILES*

NAME _____ RECORD = _____

MOTHER'S STATURE _____ FATHER'S STATURE _____

DATE	AGE	STATURE	WEIGHT	COMMENT



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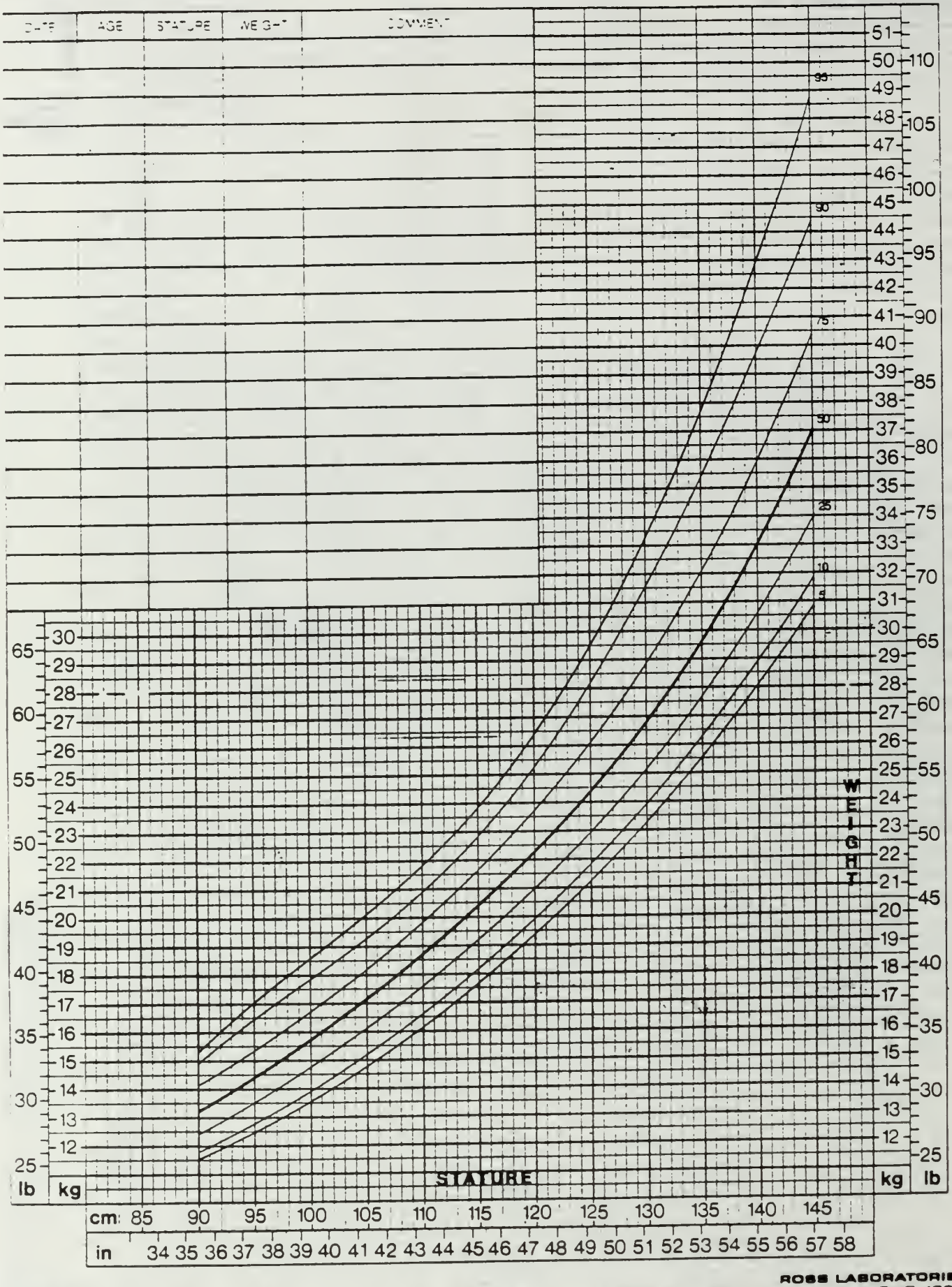
*Adapted from Hamill PVV, Drizd TA, Johnson CL, Reed RB, Roche AF, Moore WM: Physical growth, National Center for Health Statistics percentiles. AM J CLIN NUTR 32 607-629, 1979. Data from the National Center for Health Statistics (NCHS), Hyattsville, Maryland.

BOYS: PREPUBESCENT PHYSICAL GROWTH NCHS PERCENTILES*

NAME _____ RECORD # _____

DATE	AGE	STATURE	WEIGHT	COMMENT



*Adapted from Hamill PVV, Drizd TA, Johnson CL, Reed RB, Roche AF, Moore WM. Physical growth: National Center for Health Statistics percentiles. AM J CLIN NUTR 32:607-629, 1979. Data from the National Center for Health Statistics (NCHS), Hyattsville, Maryland.